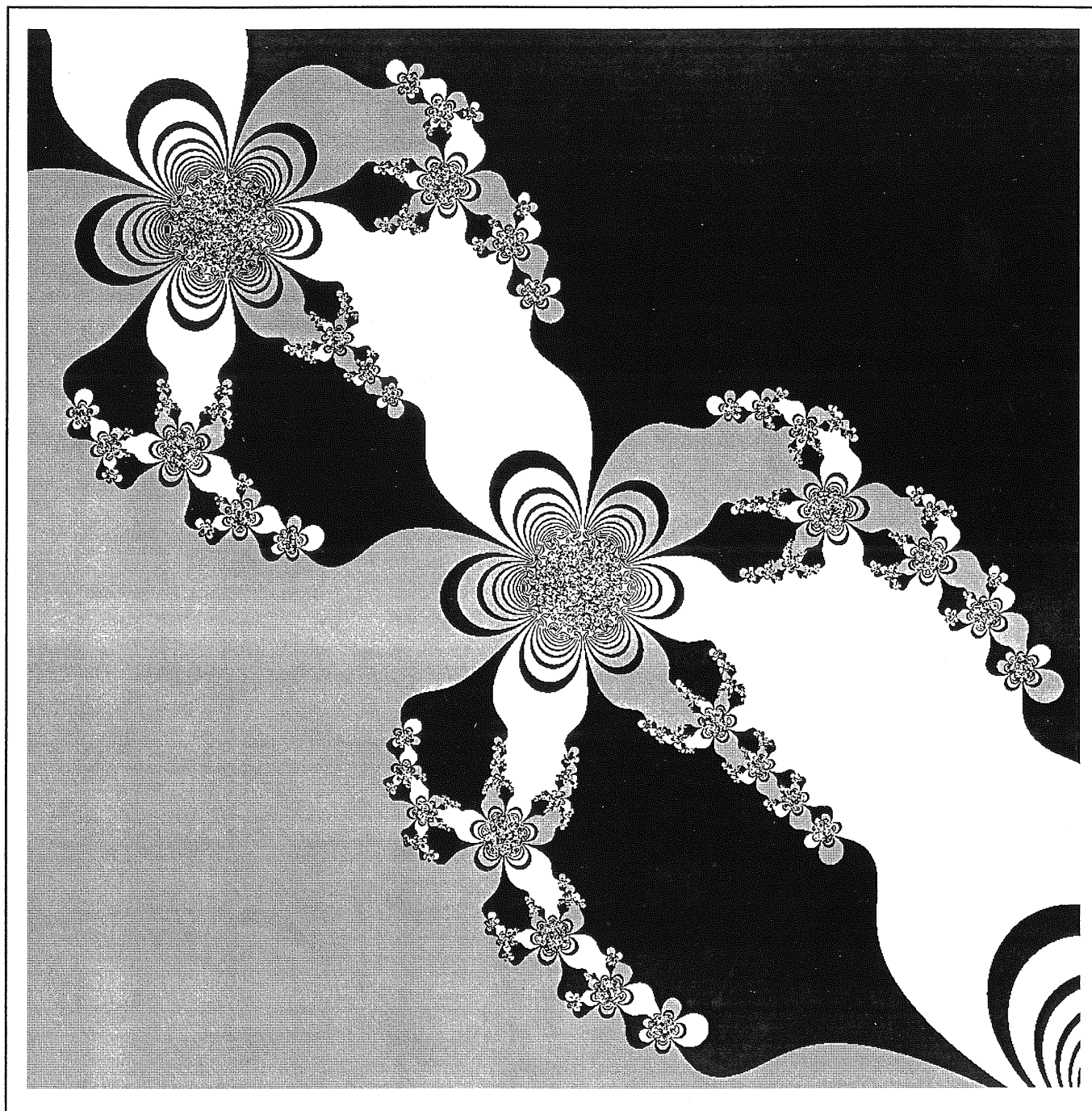


Artists Using Science and Technology

Ylem (Eye-lum): The exploding mass out of which the universe emerged in the Big Bang

Ylem Newsletter

Vol.11, No. 11 December 1991



Fractal Design by Bob Brill (See story on page 2)

Some New Fractal Images

by Bob Brill

Painting with Numbers

In recent years a new way of creating visual art has been discovered. To each pixel on a computer monitor the artist assigns a color, that is, a number that stands for a color, and this number is selected by a mathematical algorithm. This is a distinct departure from the artistic tradition. As we wield our brush or pencil or charcoal or palette knife or even mouse or electronic stylus, we think shape, we think texture, we think color, we think rhythm, we don't think number, number, number. And yet this technique is capable of producing stunning works of art. I like the fishing metaphor of Clifford Pickover in his wonderful book *Computers, Pattern, Chaos and Beauty*. You bait your hook with some algorithm and cast in your line. What comes up on your screen, as though arising from the depths of some mysterious ocean, is often exquisitely beautiful, as a look through Pickover's book will show you. I like also Pickover's friendly invitation to his readers to join in the sport. The waters are vast and largely unknown and there are infinities of undiscovered species.

Newton's Method Revisited

Mathematician John S. Hubbard discovered a series of beautiful fractal images this way while exploring Newton's method for finding the roots of polynomial equations in the complex plane. (For a gorgeous picture and an explanation see the book *Chaos* by James Gleick). I programmed a Newton generator and for awhile I enjoyed watching Hubbard-type pictures appear on my computer screen. Then I got bitten by the whatif bug. Computer artists as a class are subject to the whatif disease because the computer is the great whatif explorer of all time. In this case it was what if I stop my Newton generator after an arbitrary number of iterations and use the modulus operation to select the color. The idea here is to take the output of the generator at each point, round it to an integer, divide by the number of colors you want in your picture and use the remainder of the division as a color number. As I

hastened to modify my Newton generator the question I asked myself was: will the result still be fractal and will it still be interesting? The answers were YES and YES! Figures 1 through 3 (this page and page 2) shows Newton's method applied to the equation $z^3 - 1 = 0$, using the modulus method of coloring after 1, 2 and 3 iterations, respectively. As the series progresses, fractal imagery blossoms along the axes of a threefold radial symmetry. These are the same regions that show fractal behavior using Hubbard's coloring, but the appearance of the fractal is quite different. We see curved bands of repeating colors that form a sort of floral rosette, the typical signature of modulus coloring. The images achieved with modulus coloring grow more and more to resemble Hubbard's images as the number of iterations increases. See the cover of the newsletter for a closeup of $z^4 - 1 = 0$ after 6 iterations.

Scrambled Newton

In the middle of my astonishment at pulling marvelous monsters from the deep waters of the complex plane, the whatif bug bit again. What if I made some wrenching change to Newton's formula, so that it no longer converged to the roots of the equation, but still yielded a complex number at each iteration? Would it still be fractal? Would it still be interesting? Oh YES and YES again! There's a place in Newton's formula where you divide two values. I swapped the numerator and denominator before dividing. Forget convergence! Those values now go sailing off into strange uncharted regions. We see the same fractal blossoms with some nice distortions, but now they're stretching out along the real line. See Figure 4 (page 7), and for a closeup, Figure 5 (page 9).

Mandelbrot Revisited

The next logical departure was to ask: if we can screw around with Newton, what about trying the modulus coloring method on other well-known iterative functions like Halley's method, the Mandelbrot set and the Julia sets? Plenty

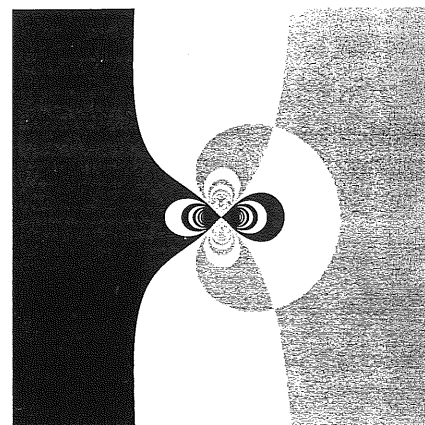


Figure 1: Fractal by Bob Brill

of good fishing here. A Mandelbrot series analogous to Figures 1 through 3 shows a similar progression, getting to look more like the Mandelbrot set on each iteration, and still showing the typical rosettes of modulus coloring. As the number of iterations increases, the images derived through modulus coloring tend more and more to resemble their orthodox cousins in both Newton's method and the Mandelbrot set. This suggests to me that the modularity of the numbers produced by iterative procedures holds a clue to some deep mathematical relationships. I believe that the beauty of these images springs from the hidden order in the number system that these algorithmic processes reveal. Other algorithmic artists please correspond. I am open to sharing fishing techniques and comparing whoppers with anyone interested. Mathematicians who find these ideas suggestive are also encouraged to get in touch: Bob Brill, 7 Lois Ct., Ann Arbor, MI 48103.

Captions for Illustrations

Cover: Newton's method on $z^4 - 1 = 0$, using modulus coloring on the real term after 6 iterations. A closeup.

Figures 1 through 3: Newton's method on $z^3 - 1 = 0$, using modulus coloring on the real term after 1, 2 and 3 iterations respectively.

Figure 4 : Scrambled Newton on $z^3 - 1 = 0$, using modulus coloring on the imaginary term after 6 iterations.

Figure 5: A closeup from Figure 4.

Ylem Events

Geometric Ornament Making Party

December 8, 3-7 pm

Paperfolders' delight! At the home/studio of Trudy Myrrh Reagan, who has recently learned some lovely shapes she will show us how to construct. Please bring "potluck" geometry projects as well as food. Scissors, glue, rulers, unusual papers would be helpful.

The Reagans, 967 Moreno, Palo Alto, CA; (415) 856-9593

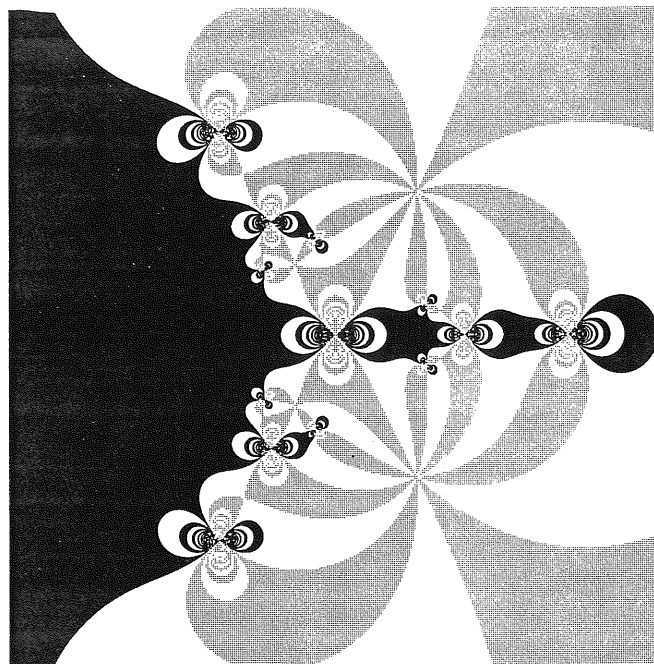
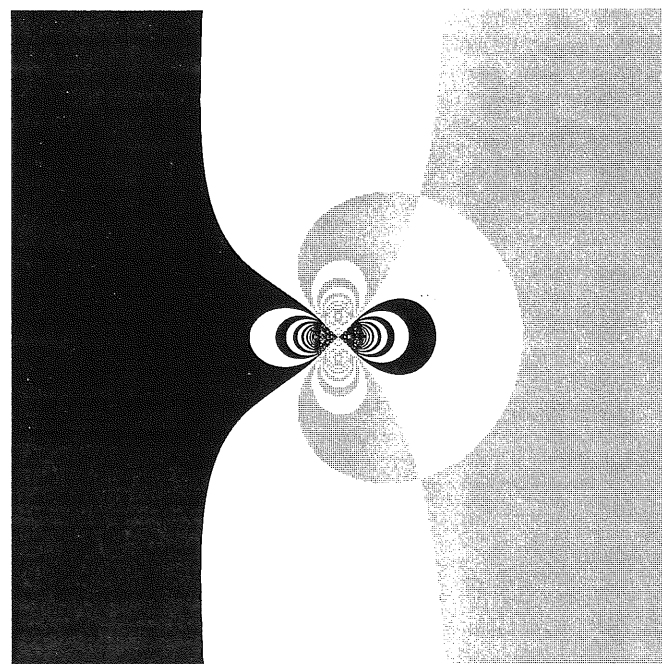
Ylem Forum: "Artists and the Cosmos"

January 8, 8 pm

Andrew Fraknoi of the Astronomical Society of the Pacific will take us on an hour-long journey through the known universe. Beth Avary, curator of a travelling exhibit, "Art of the Cosmos," will show slides of the magnificent works in this show. As usual, Ylem art will be on display in the museum lobby!

McBean Theatre, The Exploratorium, 3601 Lyon St., San Francisco; Info: Trudy (415) 856-9593

Note: Admission to the Museum is not free on this night. Please turn left at the entrance and go in the back door of the theatre.



above: Figure 3, Fractal by Bob Brill

NASA Virtual Reality Tour

January 24, 10-12 am

The Virtual Reality lab at NASA where this concept was pioneered, is giving its first demo day, and we're invited! They enjoy people like us who are implementers rather than simply reporters. The tour will last about 1 1/2 hours, with some hands-on. Afterwards, we will see the display of startling 3-D PHSColograms at the Visitor Center (see Exhibits). Reserve by Dec. 20th for this tour! Space is very limited, and we must submit a list one month ahead.

**NASA-Ames Research Center, Moffett Field, Mountain View;
Reservations: Trudy Myrrh Reagan (415) 856-9593 or write:
967 Moreno, Palo Alto, CA 94303**

left: Figure 2, Fractal by Bob Brill

We wish to thank our patrons:

Helen Carter King
Charles Schiros

Donations to Ylem are tax-deductable. The bulk of our support comes from member dues. However, gifts such as these help us enhance the unusual presentations of art, science and technology for which we are best known.

Events

December 1, 6-9 pm

Design and Animation '91

Free demos of animation on PCs, Amigas, Macintoshes and Silicon Graphics workstations. Twelve vendors will show software on these platforms. **Cogswell College, 10420 Bubb Rd., Cupertino, CA 95014; (408) 252-5550**

December 1, 2 pm

A Day Without Art

Honors those who have died of AIDS, many of whom were in the arts. The Exploratorium, one of many groups observing it, will show two films on the subject and display exhibits under development about AIDS. **The Exploratorium, 3601 Lyon St., San Francisco, CA; (415) 563-7337**

December 2-5

Science and Tradition: Transdisciplinary Perspectives (Paris)

Topics of this conference include interdisciplinary studies on different aspects of reality, and interchange between art, science, ethics and politics. To be held at UNESCO. **Union des Ingenieurs Utilisant la Langue Francaise, Dr. Marcel Locquin, 59 Ave. de Colmar, F 92500, Rueil Malmaison, France; tel. 33-1-47-14-19-72**

December 6-7

Days of Technoculture (Paris)

Conference examining various aspects of technology and art. Organized by CETECH, Centre Européen de Technoculture. **CETECH, Economie Appliquée, Université de Paris—Dauphine, Place du Marechal de Lattre de Tassigny, 75775 Paris, France; tel. 33-1-47-55-87-85**

December 8, 3-7 pm

Ylem Geometric Ornament Making Party

See details on page 2.

December 8, Noon to 6 pm

Reunion—Special Painting Show and Studio Sale

Features the reunion of cosmic painters Ron Russell and Dave Archer. Benefits the Fairfax-San Anselmo Children's Center. Special guest: Art Clokey, creator of Gumby. Music by Dave Meniketti, Scott Huckabay and Los Tres Bohemios. Million-volt painting demonstrations by Dave Archer at 1:30, 3:00 and 4:30 pm. Admission \$7, children free. **56-A Hamilton Dr. (take Ignacio exit from Hwy. 101), San Rafael**

December 9, 10-3 pm

Computing for the Disabled

Come see a variety of devices to help the disabled, some designed by the disabled themselves. A one-day exhibit, produced in collaboration with the Office of Disabled Student Services, Cal State Northridge, features intriguing new inventions that will be standard equipment tomorrow. Free with museum admission. **The Exploratorium, 3601 Lyon St., San Francisco, CA; (415) 563-7337**

January 8, 8 pm

Ylem Forum: Artists and the Cosmos

See details on page 2.

January 24, 10 am

NASA Virtual Reality Lab Tour

See details on page 2

Exhibits

December 5-28

1991 Computer Art Invitational (Portland, OR)

Computer fine art by Ylem artists Daria Barclay, Joan Truckenbrod and Rodney Chang, as well as Donna Cox, Neil Blume, and Larry Payne. Reception: **December 5, 5-9 pm.** Arrange a personal tour with **Daria (503) 640-0525. Powell's Technical Bookstore, 33 NW Park Ave., Portland, OR 97209**

January 7 - April 23

The Fourth R: Art and the Needs of Children and Youth

Exhibit examines art programs that are meeting the needs of children. Includes Ylem member Ruth Asawa's work in San Francisco. The Kids of Survival in New York, the YA/YA kids of New Orleans and others. Open T-W-Th 11-4, W 7-9 p.m. **Euphrat Gallery, De Anza College (east of Flint Center), 21250 Stevens Creek Blvd., Cupertino, CA; (408) 864-8836**

Through June 1992

PHSCologram Exhibit

Fascinating new 3-D technology is shown by 40 large full-color examples. Pioneered by Ylem member Ellen Sandor and colleagues at Illinois Institute of Technology. **Visitor Center Gallery, NASA-Ames Lab, Moffett Field near Mountain View, CA.**

Through July 18, 1992

Machines à Commuier (Paris)

Interactive videodisk on display includes a segment of *Life on a Slice* (See News of Members). **La Cité des Sciences et l'Industrie, La Villette, Paris**

Events are in San Francisco Bay Area unless otherwise noted.

Through August 15, 1992

Art of the Cosmos (New York)

Space art show includes work by member Trudy Myrrh Reagan (Myrrh). **Hayden Planetarium, American Museum of Natural History, 81st and Central Park West, New York**

Throughout 1992

Revue Virtuelle (Paris)
Interactive videodisk on display includes a segment of *Life on a Slice*. **Centre National d'Art et de la Culture Georges Pompidou, Paris**

Opportunities

C.A.G.E. (Cincinnati Artists Group Effort)

Innovative 2-D and 3-D media, film/video, installation, performance, audio art, interdisciplinary. Insurance. Open to U.S. artists. Send slides, video or audio, resumé, SASE. **C.A.G.E., 334 W. 4th St., Cincinnati, OH 45202; (513) 381-2437**

C.E.P.A. (Center for Exploratory and Perceptual Art)

Photography, film/video, computer-generated, and related media that explore the boundaries of what photography is/could be. No commission. Send 20-40 slides, resumé, statement, reviews, etc., SASE. **C.E.P.A., 700 Main St., 4th floor, Buffalo, NY 14202; (716) 856-2717**

Deadline December 1

International Computer Animation Competition

National Computer Graphics Assn. gives an International Computer Animation Award. Categories include technology and computer graphics research, short films and videos of non-professional student and faculty. Fee \$25-50. Format: 3/4" NTSC, VHS non-professional. **Int'l Computer Animation Competition, 2722 Merrilee Dr. #200, Fairfax, VA 22031; Tanya Bosse (703) 698-9600 ext. 335**

Deadline December 2

Pro Arts 1992 Annual Juried Exhibition

For artists from all nine S.F. Bay Area counties. Jurors: Joe Sam; and Kathryn Funk of San Jose Institute of Contemporary Art who is sympathetic to tech art. Ylem artists could make a strong showing in this unconventional gallery. 2-D and 3-D. Fee \$15. Two juryings, from slides, then actual work. **Pro Arts Juried Annual, 461 9th St., Oakland, CA 94607; (510) 763-4361**

Needs and Offerings

The Exploratorium Store

Gifts under \$25: *The Explorabook* that includes tools to do projects described (\$16.95); Nose Flute (\$1.25); *Exploring Light and Color Calendar* that also gives project ideas (\$9.95); Ellipto, a harmonograph drawing toy, (\$21.95); *Homemade Holography* instruction book (\$14.95); holographic earrings, (\$20.50) and much more. Ask about catalog and member discount. **Exploratorium Store, 3601 Lyon St., San Francisco, CA 94123; 1-800-359-9899**

Esoteric and Eclectic Electronic Equipment

Over 100 used items! Lighting, recording, lasers, music synthesis, audio-visual, photographic, sound reinforcement, Mac

software, signal processing, pyrotechnics. Alluring prices from Ylem member. Trades considered. Request free list. **R.W.Y., PO Box 33623Y, Seattle, WA 98133; (206) 364-7881**

Museum of Neon Art Gift Shop

Glowing jewelry, how-to books, neon art books and posters. Send for catalog. **MONA, 704 Traction Ave., Los Angeles, CA 90013; (213) 617-0274; fax (213) 620-8904**

Computers in Science and Art Catalog

Ylem member Michael Strasmich has compiled a catalog of wonderful stuff: calendars, books, videos, and software on fractals and chaos, computer animation, scientific visualization,

virtual reality, mathematics (4-D, etc.), medicine, astronomy and more. **Media Magic, PO Box 507, Nicasio, CA 94946; 1-800-882-8284; fax (415) 662-2225**

@rtomatic

Jeff Mann in Toronto reports that modified vending machines there dispense low-cost art from Toronto artists. The goal is that the idea spread to other cities and countries. Art to the masses! Contact: **Jeff (416) 588-5825; e-mail telly!intacc!jmeosbm@zoo.toronto.edu**

Brief Lessons in High Technology

A book for your relatives who are mystified by your work. Discusses the microchip, software, photonics, computer architecture, robotics, export systems (artificial intelligence) and telecommunications. \$12.95, \$2.25 shipping. CA residents add \$1.05 tax. **The Portable Stanford Book Series, Stanford Alumni Assn., Bowman Alumni House, Stanford, CA 94305; (415) 725-0694; fax (415) 725-8676**

Hungarian Video Art

Ylem has received a catalog in Hungarian and English from our Hungarian member, Tamás Waliczky, of video installation work being done there. We will share it with interested members who contact us. We request that each reader pass it on to the next promptly. Contact: **Ylem Newsletter Office, 967 Moreno, Palo Alto, CA 94303; Trudy, (415) 856-9593**

Art Calendar

Lists all kinds of competitions, slide registries, artist colonies and fellowships, fairs, art agents, industrial waste exchanges and more. Recently they published an *Annual* that lists those that accept work year-round. Ylem will try to list a few of these that pertain to experimental media each month, but for the ambitious, there is no substitute for the real thing. *Annual* only, \$10. \$32 yearly subscription (\$45, First Class postage) includes next year's *Annual*. **Art Calendar, PO Box 1040, Great Falls, VA 22066**

Institute for Computers in the Arts

An activity of the Visual Arts Foundation that develops software for artists, educational materials, interactive installations, aids to the handicapped; provides computer access to artists, conducts experimental research. Info: **Timothy Binkley, Institute for Computers in the Arts, School of Visual Arts, 209 E. 23rd St., NY, NY 10010; (212) 679-7350**

Venus and Mars

by Paul Hartal

It was Johannes Kepler who discovered that the planets in the Solar System move in elliptical orbits. He determined that in each of these ellipses the sun is one of the foci of the geometrical configuration.

Observed from the Earth, the planets however also appear to oscillate and move to the left and right of the sun. In doing so they describe startling curves. Venus, for instance, makes elongated, elegant patterns, whereas the toroidal dance of Mars produces repetitive, symmetrical self-crossing curves, loops arranged like a rubber tire of anchor ring. The apparent movement of Venus in the sky gives rise to a pattern that resembles a fivefold flower. There are many variations of fivefold flowers. The rampion (*Campanula rapunculus*) is one of them. It is an edible herb with medicinal

properties. Fivefold flowers are associated with the Pentagram of Pythagoras: the five-pointed star that can be obtained by drawing the five diagonals of a regular pentagon. Pentagrams have unique aesthetic qualities that find their expression in the Golden Section (1.618 : 1), as well as in Fibonacci numbers (e.g. 5 : 8, 8 : 13, 13 : 21, 21 : 34, etc.). The waltz of Venus and the fivefold flower belong to an intrinsic cosmic order that connects seemingly unrelated things.

The two wheels featured in "Venus and Mars" (pictured here) show the planetary dances of Venus and Mars. The front wheel of the bicycle describes the dance of Venus, while the rear one represents the ballet of Mars. The man and woman riding the vehicle personify an allegorical resonance, the duet and harmony of the spheres. The courtship of the planets, the cosmic dance is a metaphor of the ultimate unity of humankind and nature.



Venus and Mars, pen and ink by Paul Hartal

Opportunities, (continued)

Deadline December 15

Input Video Festival (Dublin, Ireland and Baltimore, MD)

International Public Television Screening Conference for exchange of program ideas among working professionals in public television. Tapes must be accompanied by an entry form. Format: 3/4" NTSC. Categories: any genre of work shown on public TV. No fee. U.S. Input Secretariat, South Carolina Educational TV, 2627 Milkwood Ave., Columbia, SC 29205; Sandie Pedlow, (803) 737-3208

Deadline December 15

Experimental Television Center, Ltd., Artist in Residence Program

Artists with prior experience in video are offered a five-day intensive residency to use video image-processing equipment. Instruction given, then artist works on creative project. Use colorizers, TBC, keyers, frame buffer, Amiga computers. Send project description showing how image processing will be used, and video of recently-completed work (3/4" or VHS), SASE. Select five-day period Feb-June. Experimental TV Center, 180 Front St., Oswego, NY 13827; (607) 687-4341

Deadline December 30

New Television

A broadcast forum for video art pieces that are substantive in content and innovative in form, 30 min. or less, and any topic. Please call for information before submitting tapes. No music videos, traditional narrative, documentary or industrial videos. Formats: 3/4", VHS. No fee. Contact first: Ms. Mertes, WNET/New York, (212) 560-2917 or Ms. Dowling, WGBH/Boston, (617) 492-2777 ext. 4228; then mail to: WNET/13, 356 W. 58th St., NY, NY 10019 or WGBH, New TV Workshop, 125 Western Ave., Boston, MA 02134

Deadline December 31

Video Refusés Festival

This festival began in 1985 as an alternative showcase of video work from the San Francisco Bay Area. Cash prizes. Fee \$5. Send work with big SASE. Formats: 3/4", Beta, 8mm, video installations, performance video. Video Refusés, PO Box, 11308, San Francisco, CA 94101; Niccolo Caldararo (415) 495-4895

Deadline December 31

Videoformes/Rencontres

Video creation competition intended for videomakers whose works have never won an award or been screened on any nationwide TV network. Works must be produced in

electronic medium only. Prizes. Videoformes, Creation Video, BP 71, F-63003 Clermont-Ferrand Cedex, France; tel. 73-906758; fax 73-924418

Deadline January 1

Leonardo Article Proposals

Articles sought for special issue of *Leonardo*: "Artistic and Scientific Work: Similarities, Differences, Interactions." Contact one of the following: L. Alcopley, 50 Central Park West, NY, NY 10023 USA; or Giorgio Caleri, Dipartimento di Fisica, Università degli studi "La Sapienza," Piazzale Aldo Moro, 2,

I-00185 Rome, Italy; fax 39-6-4463158; or Jacques Mandelbrojt, La Grande Candelle, Allée des Pins, 13009 Marseille, France; fax 33-91-26-95-53

Deadline January 8

Computer Art from the Western States

2-D printed computer-generated images created in 1990-91. Any method of printing a computer image is acceptable, for example, color or B/W prints laser prints, photographic prints and fine arts printmaking processes. Juror: Ylem member Larry Shaw of the Exploratorium. Awards. Info: Computer Art Show, Brigham City Museum, PO Box 583, Brigham City, UT 84302; (801) 723-6769

Deadline January 24

Games

For artists in Mid-Atlantic states (VA to NY + WV). Broad range of visual multi-media work sought, both low and high-tech, from found-object works to computer graphics and video graphics; also games that express socio-political and educational views. Collaborations between performance artists and visual artists are encouraged. Send \$5, up to 5 slides and/or written proposal, slide list, SASE. The BAUhouse, 1713 N. Charles St., Baltimore, MD 21201; (301) 659-5520

911 Media Arts Center

2-D windows project for Seattle area artists. Also supports independent film/video, audio, multimedia artists. Screenings twice a week. Insurance. 911 Media Arts Center, 117 Yale Ave. N, Seattle, WA 98109; (206) 682-6552

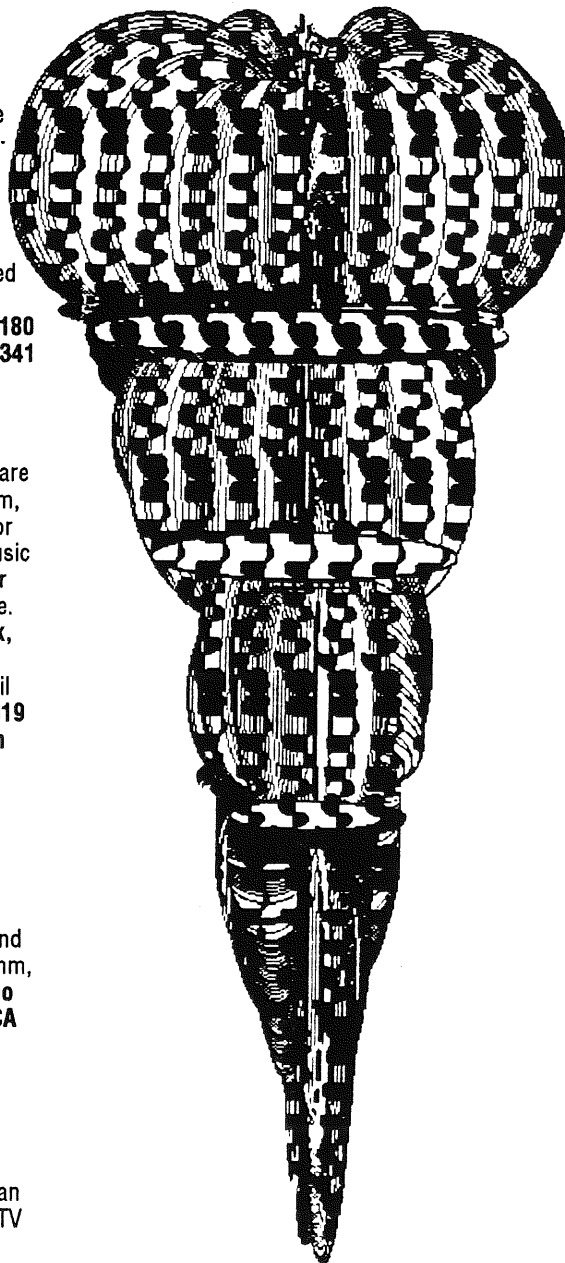
Artists' Television Access

Facilities for production and showing of all media with an experimental approach. 2-D, 3-D media plus film/video, installation, performance, dance, readings, new music. Also edit room for 1/2" VHS tape. Send letter, proposal, slides or film/video, resumé, statement, SASE. Artists' Television Access, 992 Valencia St., San Francisco, CA 94110; (415) 824-3890

Artswatch

"All media for exhibits, installations, films/videos and performances. Proposals to curate exhibits and events will also be considered." Send slides (do not send films yet), resumé, artist's statement, reviews, written description if film/performance/video proposal, SASE. Artswatch, 2337 Frankfort Ave., Louisville, KY 40206; (502) 893-9661

Some calendar items reprinted from Art Calendar (the monthly marketing and career management journal for artists, PO Box 1040, Great Falls, VA 22066, Subscription \$32/yr.), and FineArts Forum e-mail.



A Shell that Never Was, computer art by Susan Pugh

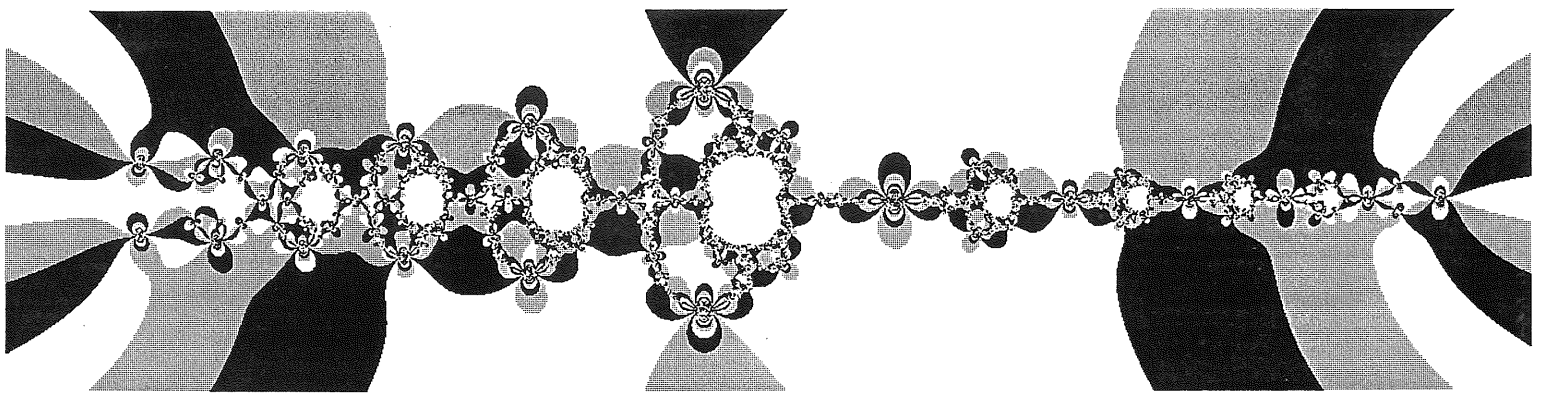


Figure 4: fractal by Bob Brill

Virtual Reality'91 Conference

reviewed by Louis M. Brill

With all that computer graphics and video have to offer, why pursue virtual reality? Yet virtual reality (VR) has become the darling of advanced communication processes. Once one is familiar with the operational aspects of VR it becomes readily apparent why: Above all, its presentation created an experience. Virtual reality not only is a means to render computer graphic landscapes, but to "visit" them.

In September, Meckler Conference Management produced in San Francisco the second annual conference & exhibition dedicated to virtual reality. The program was chaired by Sandra Kay Helsel, Ph.D. who coordinated an elaborate collection of seminars including ones on applications involved with architecture, medicine, remote sensing and entertainment.

Coming to market are devices that allow one to enter a synthetic "world." With the assistance of special headmounted viewing gear and a data glove that allows the user to move about and touch various parts of the virtual world, users are able to become totally immersed within their computerized environment. As with most of these new technologies, the classic questions appear: "When will it happen on a consumer level? In what form? How long before it appears in my living room?" The first home device, The Power Glove by the Mattel toy company has come and gone. But there was much talk of other toy-like devices.

Many talks concerned VR business, design and research. But of interest to *Ylem* readers were those presenters who explored the creative expressions of technology. An artist, Nicole Stenger, in collaboration with the Human Interface

Technology Laboratory (HIT Lab) at the University of Washington Technology Center, brought VR to life for the assembly. She said that her work-in-progress titled *Angels* is a "virtual interpretation of the mythical foundation of our world; Paradise." In Stenger's construction of Paradise, the myth has become reality, a virtual one that is visible, audible and touchable. The main inhabitants of this cyber realm are angels, creatures of delicate beauty that visitors (users) encounter through what Stenger describes as aesthetic and emotional journeys in her virtual environment. Stenger was very coy about what one would encounter within paradise, as she felt that knowledge of paradise should come from actual user contact rather than revealing background information in advance of its intended preview.

To illustrate her talk Stenger presented very detailed slides representing paradise. The angels who inhabit paradise are envisioned as delicate candle-like creatures, each with its own flame. Surrounding the top of each angel's candle-like body is a heart-shaped centerpiece floating over each candle wick. Other slides showed lush backgrounds of different colors and shapes with various angels moving about. It appears that even in paradise one can be occupied with "things" to do.

Stenger observed the essence of virtual reality is an inevitable collaboration between the users and the artist that ultimately shapes the piece into its final form. *Angels* is expected to be completed by the end of the year and we hope it soon will be on display in museums. Artists are preoccupied with virtual reality's technology and its creative applications to art in public spaces. VR accessibility, at least in the near term can be expected to be very cost-prohibitive and not readily available for art or any other consumer purpose. However, there

is every reason to believe "in time" (my guess; less than 5 years from now) an affordable headmounted display system will pave the way for some kind of virtual art in public spaces. This assumes that headmounted gear will still be a desirable way of accessing virtual space. Computer pundit Ted Nelson, creator of the concept of Hypermedia and Hypertext, noted that nowhere in the definition of virtual reality does it say anything about head-mounted displays and data gloves. A clearer definition of VR seems to emphasize more the user's relationship to his or her simulated experience than the types of hardware necessary to acquire that experience. Everything from theme park simulator rides such as *Star Tours* to electronic interfaces via television camera with complementary software can also be considered examples of a "virtual" experience.

How can VR art experiences be designed for public appreciation? How many people can see it at once? And what defines the "body of the work," since parts of these works would be changed interactively by each contact with a curious public?

One panel discussion titled "Virtual Reality in Entertainment" introduced the design criteria for the actual construction of virtual worlds. Even before keyboard and mouse are touched, much thought goes into a highly detailed needs analysis, a script, storyboards, maps of its imagined territory, and user motivations for being in this virtual world.

One begins by defining the relationship between the user and that world. Is it "user-passive," "passive-interactive," or fully-interactive? How about the user's point-of-view? Will it be on a person-to-person, or person-to-group level? On a

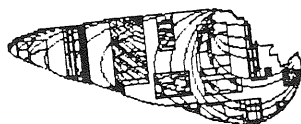
user level, environmental constraints have to be built into the experience, otherwise users get lost in misdirected actions. And finally, what kinds of emotional responses are the designers hoping to evoke from the user?

The designing of fully functional virtual worlds demands almost the same attention to detail as is involved in producing a movie. Some virtual worlds have been known to take six months or longer in planning. In other cases, templates are envisioned that would allow the speedup of this design process in bringing that world to "reality."

The entertainment seminar concluded that virtual reality is a very much sought-after medium. Versions of this technology can be expected to appear as home entertainment, arcade games, museum exhibits, theme park events and experiential movies. As one speaker concluded, virtual reality is not that much different than homesteading; "If you build virtual worlds, people will live in them."

Meckler Conference Management tracks the development of multimedia, High Definition television, virtual reality, CD-ROMS and other technological developments through various professional journals, books conferences and videotapes. For information on their publications and forthcoming conferences, contact: Meckler Conference Management, 11 Ferry Lane West, Westport, Conn. 06880; (800) 635-5537, fax (203) 454-5840.

Louis M. Brill is a project coordinator assisting in producing the local Forums for YLEM meetings, helping to create holographic YLEM covers for the newsletter and on occasion writing for it. He is also a journalist specializing in reporting on high-tech media applications for entertainment and communication systems. Louis is also working on a book discussing the history



Shell by Susan Pugh

By 10:30 pm on Sunday, the 9th of September, at Domkirkeodden (close to Hamar, Norway) about 60 people were ready for a spectacular night, having worked 'round the clock for three days. The weather turned out perfect, with complete darkness. What was planned to be a small-scale audiovisual, stereoscopic show with holograms outdoors, had grown into a real mixed-media show. The size of the events taking place at many different places as the program developed gave it great impact. Since more than 400 people showed up, every move needed time in order to guide the crowd around the parklike place from event to event. It started with quadraphonic sound, masked guides, and poetry read through megaphones inside a large tent.

Soon the crowd moved around in the night and during this trip, they were exposed to actors, dancers and other weird-looking creatures guiding or interrupting different actions. Three angels were backlit and suddenly exploded with fireworks. Later, people walked down a path "lit" by holographic lightbulbs towards an outdoor holographic exhibit. Just before passing this, a fiddler was playing live from a platform suspended in midair.

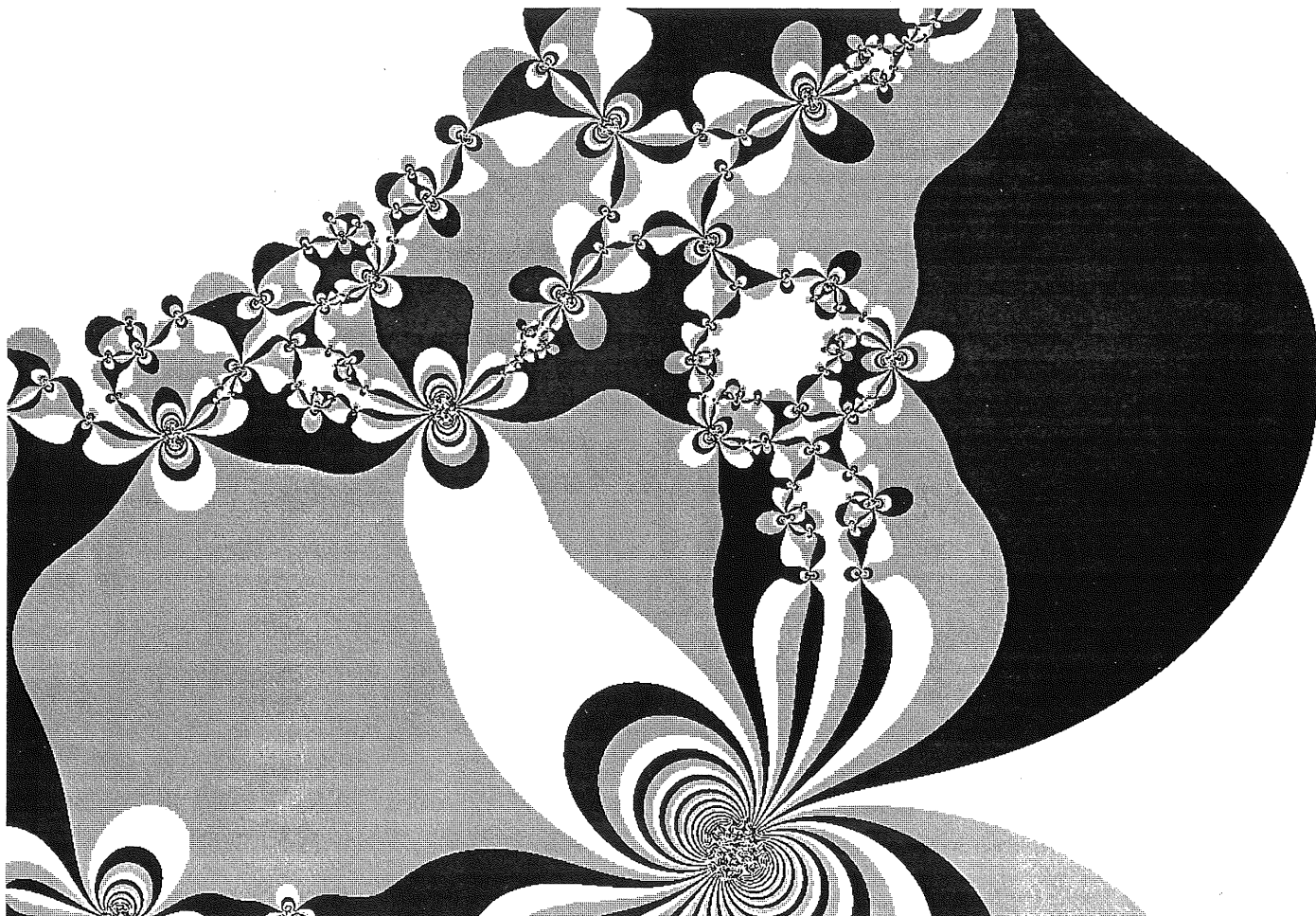
News of Members (continued from page 9)

Shunyata II, a computer video by **Venatius Joseph Pinto**, was shown this fall at ARTEC '91 in Japan, and the International Telecommunication Exhibition in Switzerland, and won an honorable mention at SMPTE (Rochester)/RAVA film/video competition. It symbolically shows our transitions through life by a mandala crossing a changing landscape that represents the mind, culminating in the death of the *atman* (self). He was also part of *Layering: A Gathering of Voices* in San Rafael, CA.

The Fall '91 issue of *Vox*, a San Francisco arts magazine, featured **Gail Gordon's** installation work, and also *Burning Man*, the annual event for which **Louis M. Brill** is publicist.

Now it was time for a rest. An outdoor scene was equipped with a triple screen that allowed for projection of 3-D images from behind. Because of the excellent screens it was possible to have dancers and actors playing live on stage in front. The actors were side-lit without destroying the projected images. This interaction of 3-D stereo pictures with live action was very successful. This place was also the site for rearscreen projection of fractal-videos, pullfrich 3-D video made with supercomputers or custom-designed computers.

The crows were driven away and as they flew even they experienced fluorescent and phosphorescent installations, and sculptures made of chemical luminescent compounds floating in midair. Down on the shore a group of children helped launch 250 lantern-lit sailboats into the lake. Even an enormous sea monster appeared glowing in the dark water. An hour later the lantern-lit boats had moved almost equal distance from each other covering a very large field. Because of the darkness, it was impossible to distinguish the borders between sea, air and land and this made the hundreds of lights a spectacular view. African drums, ritual burning of dry straw, ghosts appeared in crowds in the trees moving, flashing and screaming. Several things took place simultaneously. Even the outdoor museum of old Norwegian wooden houses was drawn into action with sculptures, odd-looking bluish light from the windows and more holograms glowing in the dark. More fireworks were carefully launched into the sky. As the clock passed midnight the show gradually came to a close. No description can justify the actual experience. More than 2000m of electric cables were laid out. It was a thrill to play with open space, trees, houses and the lake with no limitations, except in our fantasies! There might even be similar events in the future, if we turn this multi-media experience into a greenhouse for art that can be performed in the dark. Naturally so, because the show was named *Laterna Magica*.



News of Members

We extend our sympathies to **Roger Malina**, whose home burned down in the devastating fire in the Berkeley-Oakland hills in late October that destroyed nearly 2700 houses. He lost irreplaceable records and art. Soon afterward, his father-in-law, publishing magnate Robert Maxwell, suddenly died in an accident on the Atlantic Ocean. But, his wife has just given birth to a new baby girl, and the telescope he has designed, which will map the extreme ultraviolet portion of the spectrum in the heavens for the first time, will be launched on January 12th.

In October **Kenneth Snelson** wrote us: "This month I had the "unveiling" (I place quotes because all veils were found to be too small) of my huge sculpture built for Hallmark, Inc. in Kansas City, MO. It took 10 riggers, 4 cranes, and 12 days in May to assemble the monster...The piece is stainless steel 43' X 75' X 88'—the end of a three-year production. Don't know for how many more years I'll find the energy for these gargantuan pieces."

Edith Smith's computer-generated etchings appeared at the Quincy Museum of Art, Quincy, IL, at the Arizona State Art Museum, Tempe, AZ and at the New Mexico State University Art Gallery, Las Cruces, NM earlier this year. They are now at 3COM Corp. in Santa Clara, CA.

The CyberArts Conference in Los Angeles in November involved a number of Ylem members: **Ellen Sandor** and **Carl Machover** were on a panel discussing "Is it Art or Just Technology?" Among the curators of the CyberArts Gallery were **Michael Gosney** of *Verbum* magazine and Patric Prince. In the show was *Life on a Slice* with **Beverly and Hans Reiser** and **Kimberly Edwards**. **Louis M. Brill** was volunteer co-ordinator. Others participating were **Nancy Frank** and **Mason Lyte**.

First CNN's *Show Business Today*, then PBS's *The '90s* will spotlight *Life on a Slice*. A segment of it will be in a videodisk being jointly produced by Centre Pompidou and La Cité des Sciences et de l'Industrie in Paris, and will be part of exhibits there. (See Exhibits)

Ruth Asawa, Eleanor Kent, Michael Brown, Fran Valesco, and Vince Koloski participated in San Francisco's Open Studios in October and November. In Portland, OR, **Daria Bardlay** was the co-ordinator for Open Studios there. Meanwhile, **Bob Ishi** was in Europe on business where he looked up former member **Frank Dietrich**, whose new address is: Silicon Graphics, Amkanal 27, A-111, Vienna, Austria; tel. 43-1-740 40 290; FAX 43-1-740 40 299. Dietrich is the European Representative for Silicon Graphics. Back in Richmond, VA, Helaman Ferguson was exhibiting his mathematically-based sculptures at the University of Richmond.

The Spring '91 issue of *INTERSCI*, which **Diane Fenster** designs and produces at San Francisco State University, won two gold metal Ozzies for design excellence and was featured in the November issue of *Magazine Design and Production* (the competition sponsor), and will be on display at Print Production '92 in Chicago.

(continued on page 8)

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A Shell that Never Was, computer art by Susan Pugh

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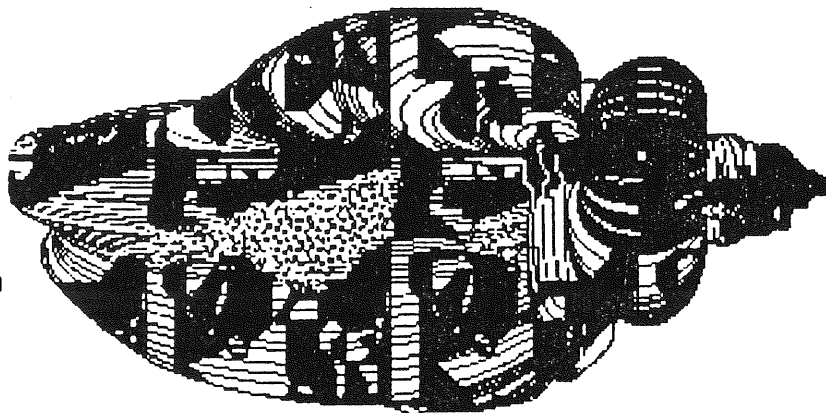
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Submissions and notices for
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Ylem Editor
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Sample Newsletters, membership
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